

2020

Adjunct Faculty Employment and Student Success in Texas Institutions of Higher Education

Robin L. Palmer
Walden University

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Robin L. Palmer

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Walden University
2020

Abstract

Adjunct Faculty Employment and Student Success in Texas Institutions of Higher
Education

by

Robin L. Palmer

MAED, University of Phoenix, 2010

BS, Austin Peay State University, 1996

Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Education

Walden University

October 2020

Abstract

Just over half of faculty members teaching in institutions of higher education (IHEs) in the United States work part time. Previous research on the relationship between part-time faculty employment and student success has produced conflicting findings and may have resulted in ineffective use of part-time faculty. The purpose of this retrospective, prediction study was to determine if the percent of part-time faculty, several institutional variables, and student demographics were significant predictors of retention and graduation rates at IHEs in Texas. Berger and Milem's theory of organizational behavior and student outcomes grounded this study using secondary analysis of publicly available archival data for 112 IHEs as reported on the website of the Texas Higher Education Coordinating Board. Multiple stepwise regression analyses indicated percent of part-time faculty was a significant negative predictor; more part-time faculty predicted lower retention and graduation rates. For the total sample and for 2-year IHEs, percent of part-time faculty and percent of non-White students were inversely related to retention, whereas percent needing developmental education in reading was positively related to retention for these IHEs, the only positive predictor identified. For the total sample, percent of part-time faculty, students needing math developmental education, and students graduating with debt were inversely related to graduation. For both 2- and 4-year IHEs, more part-time faculty related to lower graduation rates. Percent needing math developmental education was inversely related to graduation at 4-year IHEs, and average student debt was inversely related to graduation for 2-year IHEs. Hiring more full-time faculty and more effective use of part-time faculty may result in positive social change through increased student retention and graduation rates at both 2- and 4-year IHEs.

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Dedication

I dedicate this work to my parents, J. W. and Theresa Madden. They were my first support, always inspired my intellectual pursuits, and championed my efforts to knock down barriers in my path. My big brother, Jay Madden, taught me to read before I entered school starting my education. My large extended family filled with sons-in-law, aunts, uncles, and cousins encouraged me always.

Finally, I dedicate this to my children Paige, Heather, Jeffery, Kellea, Molly, and Dylan for enduring their mother as a perpetual student and motivating me to continue with their love and my grandchildren Colin Wesley, Wyatt Lee, Mickie Everleigh, and all who follow who are lovely extensions of their parents. My husband, Troy, I thank for never giving up on me, for giving me love, support, encouragement, chiding, and expertise. I thank my God for all things and especially His love, mercy, grace, wisdom, and strength.

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Chapter 1: Introduction to the Study

Faculty members and their interactions with students are key to college student success; however, increasing numbers of faculty are being employed in part-time, adjunct positions (Kezar & Maxey, 2014a). Previous research on the effects of high proportions of adjunct faculty on student success at colleges and universities has produced inconsistent findings (Curtis, Mahabir, & Vitullo, 2016; Danley-Scott & Scott, 2014; Hutto, 2017; Tincher-Ladner & King, 2014; Yu, 2015). The current study may shed additional light on this issue by addressing the effects of employing adjunct faculty on the retention and graduation rates of diverse populations of students at 2- and 4-year institutions in Texas when other institutional variables are also considered. This study may contribute to positive social change through increased student retention and graduation rates as a result of optimizing the use of adjunct faculty at Texas higher education institutions.

In this chapter, I summarize current research on the relationship between use of adjunct faculty and student retention and graduation rates. Berger and Milem's (2000) theory of organizational behavior and student outcomes, which served as the theoretical framework for this study, is introduced and then discussed further in the second chapter. The nonexperimental quantitative nature of the study is explained, and definitions of key components, assumptions, scope, delimitations, and limitations of the design are provided. Finally, the potential significance of this study, which is to affect the way institutions use part-time faculty to better ensure student success in a fiscally responsible manner, is discussed.

Background

Using 15 years of data from The College Entrance Examination Board's Annual Survey of College Standard Research Compilation and Integrated Postsecondary Education Data System (IPEDS) Faculty Salary, Ehrenberg and Zhang (2005) investigated concerns that the practice of hiring nontenured faculty to reduce institutional operating costs might lead to reduced graduation rates. The authors concluded that increased percentages of both part- and full-time, nontenured or nontenure track faculty decrease graduation rates at 4-year institutions. The authors also found that higher proportions of Pell Grant recipients and a higher average dollar amount per Pell Grant recipient was related to reduced graduation rates. However, the average 25th and 75th percentile math SAT scores in some groups of incoming students was related to increased graduation rates.

The significant predictors from Ehrenberg and Zhang's (2005) landmark analysis have been studied by multiple authors in national (Deutsch, 2015), state (Samuel & Scott, 2014), and local (Prystowsky, 2018) contexts. Some authors have conducted their studies in 2-year institutions (Schademan & Thompson, 2016), some in 4-year institutions (Hoffman, 2014), and some have compared the effects of these variables between 2- and 4-year institutions (Morales, 2014; Stenerson, Blanchard, Fassiotto, Hernandez, & Muth, 2010). However, their results were inconsistent, and none compared the effects of these variables among highly diverse 2- and 4-year institutions such as those found in Texas.

Previous studies about how the proportion of part-time faculty affects student retention and graduation rates have focused on student-faculty interactions (Curtis et al.,

2016; Danley-Scott & Scott, 2014; Kezar & Maxey, 2014a) and the cultural diversity of the student body (Deutsch, 2015; Samuel & Scott, 2014; Yu, Campbell, & Mendoza, 2015). Researchers have found that both faculty cordiality toward students in 4-year institutions (Hoffman, 2014) and cultural sensitivity in 2-year institutions (Schademan & Thompson, 2016) led to improved student outcomes, but Kezar and Maxey (2014a) expressed concern that adjunct faculty do not have enough exposure to students to optimize their interactions. Danley-Scott and Scott (2014) related improved retention and graduation rates to effective use of adjunct faculty. However, whether the proportion of adjunct faculty is related to student outcomes, particularly for diverse student populations, remains undetermined.

Researchers have found lower retention and graduation rates in 2-year community colleges than 4-year universities (Curtis et al., 2016) and among ethnic minorities and otherwise disadvantaged students in Texas (Samuel & Scott, 2014) and other states (Mertes, 2013). Conflicting results in previous research about the relationship between the proportion of adjunct faculty and student success may have resulted in ineffective use of adjunct faculty; thus, there may be a gap in practice at some institutions. In this study, I examined the relationship between the use of part-time faculty and student outcomes in state-supported, 2- and 4-year institutions in Texas that have highly diverse student enrollments.

Problem Statement

Just over half (51.2%) of faculty members teaching in higher education institutions in the United States work part time; they are often called adjunct, nontenured,

or contingent faculty (Kezar & Maxey, 2014a). Adjunct instructors are often hired to ease budget concerns that are an increasing problem in higher education (Caruth & Caruth, 2013; Yu et al., 2015). Studies of the success of 2-year community college students (Rogers, 2015) and 4-year college students (Curtis et al., 2016) have found that higher proportions of adjunct faculty are associated with decreased retention (Caruth & Caruth, 2013) and graduation rates (Tincher-Ladner & King, 2014). To the contrary, Yu (2015) reported that higher proportions of adjunct faculty were associated with increased graduation rates at community colleges. Hutto (2017) found that community college students enrolled in courses taught by adjunct faculty had higher course retention rates, though the author conceded that a high proportion of adjunct faculty were teaching introductory courses. These conflicting results suggest that the effects that institutions employing a high proportion of part-time faculty have on student success may represent a gap in practice at some institutions that needs to be explored further.

Purpose of the Study

The purpose of this quantitative study was to determine if the proportion of adjunct faculty is predictive of student retention and graduation rates in public 2- and 4-year colleges in Texas that have diverse student enrollments. The percentage of part-time faculty was included as an independent variable to remain consistent with previous research that found it to be related (either positively or negatively) to student retention and graduation rates (Caruth & Caruth, 2013; Hutto, 2017; Tincher-Ladner & King, 2014; Yu, 2015). Racial/ethnic demographics of students, percentage of students in developmental courses as an indicator of academic preparation, and the average amount

of Pell grant per student recipient, the average student debt per graduating student, and the percentage of students graduating with debt as indicators of economic disadvantage were also included as independent variables.

Research Questions and Hypotheses

In this study, I determined whether the proportion of adjunct faculty is predictive of the retention and graduation rates in diverse, public, 2- and 4-year colleges in Texas. The independent variable reflecting use of adjunct faculty was the percentage of part-time faculty employed by the institution. Independent variables reflecting student diversity include enrollment percentages by race/ethnicity; percentage of students in developmental courses as a measure of academic preparedness; and average amount of Pell Grant received per student, the average student debt per graduating student, and the percentage of students graduating with debt as indicators of economic disadvantage. Average amount of Pell Grant received was computed as the total amount of Pell Grant monies received by each institution divided by the total number of recipients at each institution. The dependent variable of retention was measured by the percentage of students who are still enrolled in school after 1 year. The graduation rates for 2-year institutions was measured at the 3-year point and 4-year institutions was measured at the 6-year point as is the norm for degree completion (see Texas Higher Education Coordinating Board [THECB], 2018a).

RQ1: Which of the following variables are predictors of student retention for 2- and 4-year institutions in Texas?

- percentage of part-time faculty

- enrollment percentages by race/ethnicity
- percentage of students in developmental courses
- amount of Pell Grant received per recipient
- the average student debt per graduating student
- the percentage of students graduating with debt

H_01 : None of the following variables are significant predictors of student retention rates for 2- and 4-year institutions in Texas.

- percentage of part-time faculty
- enrollment percentages by race/ethnicity
- percentage of students in developmental courses
- amount of Pell Grant received per recipient
- the average student debt per graduating student
- the percentage of students graduating with debt

H_A1 : At least one of the following variables is a significant predictor of student retention rates for 2- and 4-year institutions in Texas.

- percentage of part-time faculty
- enrollment percentages by race/ethnicity
- percentage of students in developmental courses
- amount of Pell Grant received per recipient
- the average student debt per graduating student
- the percentage of students graduating with debt

RQ2: Which of the following variables are predictors of student graduation rates for 2- and 4-year institutions in Texas?

- percentage of part-time faculty
- enrollment percentages by race/ethnicity
- percentage of students in developmental courses
- amount of Pell Grant received per recipient
- the average student debt per graduating student
- the percentage of students graduating with debt

H_02 : None of the following variables are significant predictors of student graduation rates for 2- and 4-year institutions in Texas.

- percentage of part-time faculty
- enrollment percentages by race/ethnicity
- percentage of students in developmental courses
- amount of Pell Grant received per recipient
- the average student debt per graduating student
- the percentage of students graduating with debt

H_A2 : At least one of the following variables is a significant predictor of student graduation rates for 2- and 4-year institutions in Texas.

- percentage of part-time faculty
- enrollment percentages by race/ethnicity
- percentage of students in developmental courses
- amount of Pell Grant received per recipient

- the average student debt per graduating student
- the percentage of students graduating with debt

Theoretical Framework for the Study

Berger and Milem (2000) found that the influence of organizational behavior on student outcomes in higher education was not addressed by existing literature but discovered evidence that a relationship existed. The researchers developed a model to classify organizational behavior that included five dimensions: collegial, symbolic, bureaucratic, political, and systemic. The dimension that relates most closely to the current study is systemic in that the systemic behavior of hiring part-time faculty for financial convenience may affect student outcomes. Berger and Milem concluded that retention and graduation rates could be affected because systemic organizational behavior might affect some students. I will discuss Berger and Milem's theory in greater detail as it relates to this study in the next chapter.

Nature of the Study

In this quantitative, nonexperimental, retrospective, prediction study, I used existing, publicly available, secondary data for each of the public 2- and 4-year institutions in Texas as reported on the THECB website and IPEDS. This research design is appropriate when research questions can be answered by readily available data that have not been fully explored (Creswell, 2012; Lodico, Spaulding, & Voegtle, 2010). A multiple regression analysis was appropriate to use to analyze these data because it allows researchers to examine the relationships between multiple continuous or categorical independent variables and a continuous dependent variable (see McDonald,

2014). Five of the independent variables in the current study are percentages that served as a score ranging from zero to 100 for the individual institution. Although the base for computing these percentages may vary by institution, the values are internally consistent for each institution. Two variables, amount of Pell Grant received per recipient and the average student debt per graduating student, are mean dollar amounts.

Percentage of part-time faculty was the continuous, institutional, independent variable. The variable of type of institution included 2- and 4-year, public higher education institutions. Four student characteristics were comprised of enrollment percentages by race/ethnicity; percentage of students in developmental courses; and proportion of economically disadvantaged students as indicated by average Pell Grant dollar amount received per recipient, the average student debt per graduating student, and the percentage of students graduating with debt. The dependent variables, retention and graduation rates, were continuous as well.

Definitions

Enrollment/fall headcount: The institutional fall headcount enrollment by race/ethnicity, including all full- and part-time students (THECB, 2018a).

Other: All other races not individually listed, including Native Hawaiian, other Pacific Islander, American Indian, Native Alaskan, Asian, multiracial not including African American, international students, or unknown origin (THECB, 2018a).

Public, 2-year college 3-year rates: The percentage of first-time, credential-seeking undergraduates who graduate within 3 academic years of those students who

enrolled in their first fall as full-time students (i.e., those taking 12 or more semester credit hours; THECB, 2018a).

Public university 6-year rates: The percentage of first-time entering, degree-seeking students who graduated with a bachelor's degree or higher from the same institution or another Texas institution after 6 academic years of those students who enrolled in their first fall as full-time students (i.e., those taking 12 or more semester credit hours; THECB, 2018a).

Total students below state standard: Students in college for the first time (both full- and part-time) who did not meet the state readiness standards in math, reading, and/or writing at the time of enrollment (THECB, 2018a).

Assumptions

An assumption is something generally accepted as true but that cannot be proven (Lodico et al., 2010). For this secondary data analysis, I assumed the accuracy of data obtained by the THECB from the various institutions and subsequently posted on the agency website. With no way to determine the credentials or teaching ability of the faculty included in the study, I also assumed a degree of equivalency among the adjunct faculty of different institutions. Along with the assumption that adjunct faculty are similarly prepared, the manner in which adjunct faculty are used was also indistinguishable in the data set used. For example, a large number of part-time faculty in Hutto's (2017) study taught only lower-level courses, which may be the case at some, but not all, institutions included in this study.

Scope and Delimitations

In this study, I focused on the relationships between the proportion of part-time faculty and the retention and graduation rates of diverse students at 2- and 4-year institutions in Texas in order to distinguish how the use of part-time faculty may affect 2- and 4-year institutions differently as well as to determine how well the results of national studies apply to public institutions in Texas. Texas was an ideal place for this study because of the large number of students, particularly ethnic/racial minority students, who do not complete degrees despite successful efforts to increase their enrollment (see Samuel & Scott, 2014). Although completion rates for both African American and Hispanic students in Texas have increased from 2016 to 2017, the rates are still below the state average (THECB, 2018b).

All public, 2- and 4-year institutions in Texas were included in this study because the varying degrees of diversity among these colleges may illuminate whether there are different effects of adjunct employment on student retention and graduation rates between schools with various levels of racial/ethnic minority enrollments, academic preparedness, and economic disadvantages. Because this study included primarily White, Hispanic, and African American student enrollment in Texas institutions, the small percentages of Asian and international students were combined with the Other category.

I did not include private institutions in this study because they are not required to adhere to the common core of coursework that enabled me to compare 2-year institutions to 4-year institutions. Additionally, although retention and graduation data are available for private schools in Texas through the THECB website, these schools are not required

to use nor report the results of the Texas Success Initiative (TSI; THECB, 2018c), which was used to determine the number of students requiring developmental education courses.

Although the percentage of faculty that are part time was the focus of this study, I included other variables previously shown to be predictive of student retention and graduation rates to take these into account when determining the relationship of percentage of part-time faculty to student success. Using both retention and graduation rates as outcome measures, Deutsch (2015) replicated Ehrenberg and Zhang's (2005) earlier study with the inclusion of additional variables found to be predictive of attrition by Chen (2012). Deutsch found the percentage of disadvantaged, racial/ethnic minority students; reading and math SAT scores; academic support per full-time student equivalent (FTE); and student services per FTE were predictive of student retention rates in public institutions. All these variables except student services per FTE and the additional FTE student enrollment were predictive of graduation rates in public institutions (Deutsch, 2015).

I included most of the significant predictors from Deutsch's (2015) study while limiting my study to public institutions in Texas; however, I expanded it to include both 2- and 4-year institutions. Rather than categorizing African American and Hispanic students as disadvantaged minorities, I distinguished between the two race/ethnicities in order to illuminate any differences between the two groups. Concerning the construct of academic preparedness, Deutsch found SAT scores to be significantly predictive of student retention and graduation rates at 4-year schools; however, the SAT is not required for admission to most 2-year institutions, and therefore, scores for students at these

institutions are unavailable. Instead, I selected the percentage of students requiring developmental education classes in reading and the percentage of students requiring developmental education classes in math, available for both 2- and 4-year institutions, as measures of academic preparedness.

With respect to measures of economic disadvantage, Ehrenberg and Zhang (2005) found that the higher the amount of Pell Grant received per recipient, the lower the graduation rate for the institution. The authors suggested that a higher Pell Grant amount meant a lower economic status or a higher tuition rate. Either of these two explanations could cause a financial hardship. However, Deutsch (2015) found the average dollar amount of federal aid per student to be predictive of retention and graduation rates but only in private schools. Despite this discrepancy, receipt of Pell funds has been an important indicator of economic disadvantage (Ehrenberg & Zhang, 2005; Hicks, Amos, West, & Maheshwari, 2013; Li, Gándara, & Assalone, 2018; Luna-Torres, McKinney, Horn, & Jones, 2018; Martin, Galentino, & Townsend, 2014; Martin, Goldwasser, & Harris, 2017; Yu et al., 2015) and were included in the current study. Deutsch cited Ronco and Cahill (2006) who found grade point average (GPA) to be a predictor of academic success but elected not to include GPA as a predictor variable. Recently, authors have found first-year GPA (Boateng, Plopper, & Keith, 2016) and overall college GPA (Shaw, Wu, Irwin, & Patrizi, 2016) to be predictive of student success. In the current study, the developmental education requirement served as the indicator for academic preparedness, negating the need to include high school GPA. I also did not include FTE enrollment, which Deutsch found predictive of graduation, but not retention,

in public institutions. I did not consider expenditure on academic or student services support, the former of which was only predictive of graduation and the latter of which was only predictive of retention (see Deutsch, 2015).

The results of this study may not be generalizable to institutions with different demographics. Although the results might not be generalizable to institutions with different demographics, a relationship found between the percentage of adjunct faculty and the success of African American or Hispanic students might contribute to the understanding of how this variable affects different racial/ethnic groups, which might be of interest to institutions outside of Texas. The results also might highlight any differences between 2- and 4-year institutions that might be generalizable outside of Texas.

Limitations

Internal validity refers to whether the independent variables truly accounted for the differences measured in the dependent variables (Lodico et al., 2010). Although I attempted to show relationships between the independent and dependent variables in this study, I was not able to show causality with this correlational design. Nevertheless, selection of the independent variables for this study was based on variables found to be predictive of the dependent variables by both Ehrenberg and Zhang (2005) and Deutsch (2015). Where practical, I used the same variables as were used by Deutsch. Although the relationship of the percentage of adjunct faculty with students' success was the focus of this study, student variables were included to identify differences that may relate to different student populations.

External validity refers to the generalizability of results to other populations (Lodico et al., 2010). This study expanded upon Deutsch's (2015) study because it included both 2- and 4-year institutions and because I included African American and Hispanic students separately rather than together in a disadvantaged racial/ethnic student category. The results of this study, however, might not be generalizable to private institutions, institutions in other locations outside of Texas, or those with dissimilar student populations.

Many variables affect student success. For instance, researchers have found pedagogical practices (Jolley, Cross, & Bryant, 2014; Schademan & Thompson, 2016; Witt, Schrodt, Wheelless, & Bryand, 2014) and instructor preparedness (Angelopulo, 2013; Trammell & Aldrich, 2016) to be related to retention and graduation rates. These concepts were not included in this study.

Significance

The findings of this study may advance knowledge of the relationship between employment of adjunct faculty and student success, specifically among 2- and 4-year, public higher education institutions in Texas with their varying proportions of racial/ethnic and economic diversity. As such, the original contribution of this study may lead to the establishment of guidelines for the practice of using part-time faculty to better ensure student success in a fiscally responsible manner. Such guidelines may, in turn, lead to positive social change by increasing both the number and diversity of students, including Hispanic and African American students; economically disadvantaged students;

and students needing developmental courses who graduate from 2- and 4-year higher education institutions in Texas.

Summary

In this chapter, I addressed how the use of part-time faculty affects student outcomes as well as background information related to this problem. The purpose of this quantitative study was to determine if the proportion of adjunct faculty is predictive of student retention and graduation rates in public, 2- and 4-year colleges in Texas that have diverse student enrollments. I considered the use of part-time faculty to be a systemic behavior as opposed to the other four dimensions of organizational behavior described in Berger and Milem's (2000) theory. The quantitative, nonexperimental design included variables found to be significantly related to retention and graduation by Ehrenberg and Zhang (2005) and later by Deutsch (2015) in their studies of part-time faculty, though the population, some of the measurement methods, and the statistical methods differed. Specifically, I included African American students and Hispanic students separately, rather than together as disadvantaged racial/ethnic students. Using enrollment in math and reading developmental education rather than SAT scores enabled me to include and compare both 2- and 4-year institutions. In the next chapter, I will expand on Berger and Milem's theory and the research findings of Ehrenberg and Zhang and Deutsch. Recent literature related to all variables included in the current study will be reviewed.

Chapter 2: Literature Review

Many higher education institutions have restructured to meet the needs of modernity. One change that has occurred is the practice of hiring adjunct instructors. Brennan and Magness (2018) asserted that due to financial concerns, universities employ adjunct or contingent faculty in increasingly higher proportions compared to full-time faculty. Similarly, Curtis et al. (2016) reported that the majority of faculty employed by community colleges is adjunct faculty, and research has shown that more than half of faculty in higher education are part time (Kezar & Maxey, 2014a). Because of previous contradictory research on part-time faculty and their effect on student success, the use of part-time faculty has likely been ineffective. The purpose of this quantitative study was to determine if the proportion of adjunct faculty is predictive of student retention and graduation rates in public, 2- and 4-year colleges in Texas that have diverse student enrollments.

Although hiring more adjunct faculty may help with budget concerns, the practice may affect student outcomes negatively. Nica (2018) explained that budgetary needs for using higher proportions of part-time faculty have led to accepting faculty applicants who are not necessarily the first choice, and therefore, the quality of teaching and academics has suffered as a result. Kezar, Maxey, and Holcombe (2016) determined that the overuse of contingent faculty resulted in poor student outcomes. Hecht, Balseiro, and Maxey (2016) found that most literature supported the idea that although an increase in the proportion of adjunct faculty appeared to negatively affect student outcomes, more research was necessary.

The research reviewed in this chapter focuses on part-time faculty and the possible relationship between part-time faculty employment and student success, specifically retention and graduation. I also reviewed articles related to other variables that have been found to affect retention and graduation rates. This chapter includes the literature search strategy, theoretical foundation, and a comprehensive literature review. In the literature search strategy section, I detail the databases explored, the keywords employed, and the criteria for article selection. The theoretical foundation, based on the work of Berger and Milem (2000), provides the framework for the literature review.

Literature Search Strategy

I searched for the literature in this review using multiple databases. The databases used most often were ERIC, EBSCO, Education Source, SAGE, and ProQuest Central. Keyword searches included *community college, universities, higher education, adjunct instructor, contingent faculty, part-time faculty, full-time faculty, faculty, retention rates, graduation rates, developmental education, Pell grant, student debt, socioeconomic, economic disadvantage, ethnicity, and race*. All keyword searches were conducted both individually and in various combinations using both AND and OR. Articles selected were current, peer-reviewed literature that had been published within the last 5 years as well as seminal articles in the field. I reviewed more than 1,000 articles, several of which were duplicates that appeared in more than one keyword search. Others were not relevant because they were too specific, pertaining only to a certain discipline, such as nursing.

Theoretical Foundation

In their studies of organizational behavior in higher education institutions as related to student outcomes, Berger and Milem (2000) found that although evidence of a relationship existed, it was not addressed by the existing literature. Based on their research, Berger and Milem created a model to classify higher education organizational behavior using five dimensions: collegial, symbolic, bureaucratic, systemic, and political. They asserted that all organizations contain aspects of each dimension at different levels, high to low, so that each organization is unique. High levels of each dimension indicate an intense organization, while low levels indicate a weak organization. Berger and Milem stated that universities and colleges falling somewhere in the midlevel range represent a moderate atmosphere; however, no single institution is perfectly balanced among the five dimensions, and the unique composition of each institution and the subsequent behavior of the institution as a result of that composition is related to student outcomes.

Institutional characteristics such as the ratio of adjunct faculty to full-time faculty are indicative organizational behavior (Berger & Milem, 2000). Both 2- and 4-year higher education institutions can increase their course enrollment with minimal, if any, increase in full-time faculty by using adjunct faculty to teach the courses. The greater ratio of adjunct to full-time faculty is not only economically feasible but also gives greater flexibility in course offerings. However, the effects of this organizational behavior on student retention may vary among institutions. In accordance with Berger and Milem's (2000) work, systemic organizational behavior might affect some students more than others and, therefore, may differentially affect the retention and graduation

rates of institutions. *Systemic organizational behavior*, as defined by Berger and Milem, is “the ability to import people, ideas, and resources through permeable organizational boundaries and transform them into educational and scholarly outputs” (p. 293). Berger and Milem reported that while behavioral, structural, and psychological peer group characteristics influence how students regard their college environment, individual student entry characteristics, such as race/ethnicity and socioeconomic status, are key to understanding how students are affected differently.

Following Berger and Milem’s (2000) theory that organizational behavior affects student outcomes, Shields and O’Dwyer (2017) found that students enrolled in developmental education at both 2- and 4-year institutions were less likely to achieve a bachelor’s degree. More closely related to this study, Deutsch (2015) employed Berger and Milem’s framework to study the effect of employing adjuncts on students’ retention and graduation in a national sample of 4-year universities in the United States. The theory of Berger and Milem relates to this study in that the systemic behavior they describe includes the importing of people, such as hiring part-time faculty. These authors found that such institutional practices can affect student outcomes. In the present study, I examined the effects of hiring higher proportions of part-time faculty on student retention and graduation rates.

Literature Review Related to Key Concepts and Variables

Drawing from Berger and Milem’s (2000) theoretical framework concerning how organizational behavior and student outcomes may be related, Deutsch (2015) examined the relationship between the proportion of adjunct faculty teaching at 4-year institutions

and retention and graduation rates. In the current study, I examined the effects of employment of adjunct faculty at 2-year institutions as compared to that of 4-year institutions. The independent variables I explored are the use of part-time faculty and student characteristics, including student preparedness, race/ethnicity, and economic disadvantage. The student outcomes addressed in this study are student retention and graduation rates. In this section, I review studies related to the factors used as the independent variables in the current study.

Adjunct Instructors and Retention and Graduation

The goal of most students when beginning college is ultimately graduation. However, to reach the goal of graduation, students must complete their individual courses and degree plans, meaning they must be retained in college (Hutto, 2017). Retention rates are also a gauge for the success for higher education institutions. Because adjunct instructors are being hired in increasingly higher proportions at both 2- and 4-year institutions (Stenerson et al., 2010), knowing the effect, if any, that this higher proportion of adjuncts has on retention and graduation rates is important to all stakeholders.

Adjunct faculty in 4-year schools. Multiple authors (i.e., Caruth & Caruth, 2013; Chaden, 2013; Stromquist, 2017) have expressed concern that hiring higher proportions of adjunct faculty at 4-year institutions may affect student retention and graduation rates. Chaden (2013) explored current literature about the role of faculty in improving retention and suggested that the ratio of full-time to part-time faculty was an important issue that needed further investigation. The author explained that part-time faculty have a disproportionate classroom teaching workload compared to time available for the

adequate engagement necessary to aid in student retention. After studying IPEDS data for 4,426 degree-granting universities, Caruth and Caruth (2013) validated Chaden's concern through concluding that although hiring adjunct instructors is essential for the financial health of U.S. higher education, higher proportions of adjunct instructors coincide with lower retention and graduation rates.

Also concerned with the hiring of higher proportions of part-time faculty, Stromquist (2017) expounded on the expanding divide between contingent and permanent faculty as well as the effects of that divide on student outcomes. Through an extensive literature review, the author discerned that overworked, marginalized contingent faculty had less time for interaction with students, which would likely culminate with languishing student performance. Stromquist further explained that because of the perceived need for change and restructuring in U.S. higher education and an increased call for accountability, scholarly productivity is more regularly quantified and teaching is being devalued. This development in faculty responsibilities has created a growing division between contingent and permanent faculty with permanent faculty focused on research and contingent faculty shouldering increasing teaching obligations (Stromquist, 2017).

Researchers have used various methods to show that faculty-student relationships influence student success. After conducting an in-depth literature review to examine the importance of faculty-student relationships as related to student retention and graduation, Hoffman (2014) concluded that positive relationships between faculty and students are

paramount to student retention and success as well as that instructors have more responsibility than their students in cultivating those relationships.

The difficulty of part-time instructors in cultivating good relationships with students may stem from the poor working conditions of contingent faculty described by Kezar and Maxey (2014b), such as last-minute hiring and lack of planning or professional development opportunities. The authors further reported that poor working conditions have resulted in poor educational experiences for students, which, in turn, have led to lower retention and graduation rates. In contrast, quality interaction between faculty and students may have several learning benefits, such as students' validation, increased motivation and passion, and more self-confidence (Kezar & Maxey, 2014a). Kezar and Maxey asserted that first-year and developmental courses are often taught by adjunct faculty, the faculty with the least time to foster quality interactions with students. Faculty-student interaction is important to student outcomes; however, policymakers not understanding that importance is, in part, responsible for the larger proportions of contingent faculty (Kezar & Maxey, 2014a).

In contrast, Figlio, Schapiro, and Soter (2015) found that part-time faculty had a positive effect on student success. The authors used a regression approach to investigate the effects of tenured versus part-time faculty on successful student learning and subsequent enrollment in courses in a given subject. Using archival data from all 15,662 Northwestern University students admitted between 2001 and 2008, Figlio et al. concluded that students were more likely to take additional classes in a given subject and

perform better in those subsequent classes when their first course in that topic was taught by a part-time faculty member than if it were taught by a tenured faculty member.

Adjunct faculty in 2-year schools. Graduation rates may be thought of as an institution's ultimate measure of student success (Council of Regional Accrediting Commissions, 2018). Tincher-Ladner and King (2014) discussed the effects of full-time community college faculty on graduation rates and the detrimental practice of hiring disproportionate numbers of adjunct faculty. Using a correlational research design, the authors discovered that higher graduation rates were related to higher percentages of full-time faculty.

Curtis et al. (2016) concluded that faculty-student interaction is paramount to community college student success and noted that part-time faculty have reported diverse working conditions and motivations for work that affected their interactions with students. The authors surveyed 1,730 public community college faculty members, of whom 712 responded to an online questionnaire about work status and work motivations containing 68 questions, both open and close ended. The authors suggested that better working conditions and more support of adjunct faculty may lead to more positive faculty-student interactions and, in turn, greater student success.

Two studies (Yu, 2015; Yu et al., 2015) using different means of analyzing the same data for 1,940 students at 50 community colleges from the IPEDS and the Beginning Postsecondary Students Longitudinal Study found differing results concerning the effect of the proportion of part-time faculty on completion rates. Yu (2015), using structural equation modelling, found greater numbers of part-time faculty related to

higher retention rates. Yu et al. (2015) used a multilevel logistic regression model with the same data sources to more specifically examine the effect of the proportion of part-time faculty on graduation rates. The authors concluded that the “analytical results indicate that employing a higher percentage of part-time faculty has either minimal or nonsignificant association with students’ likelihood of student degree and/or certificate completion” (pp. 1000-1001).

Other authors (i.e., Rogers, 2015; Salley & Shaw, 2015) have similarly concluded that the practice of hiring higher proportions of part-time faculty has little or no significant effect on student outcomes. Rogers (2015) found that faculty employment status was not significantly related to student success in individual courses for four cohorts across 10 separate campuses. Rogers examined part- and full-time faculty employment status in association with student outcomes using a regression approach with student records data from the Maricopa County Community College District. Similarly, using both correlational and comparative research methods, Salley and Shaw (2015) found no statistically significant relationship between faculty employment status and student success in community colleges.

Similar to Figlio et al.’s (2015) study on 4-year institutions, Hutto (2017) found a positive relationship between the use of part-time faculty and student outcomes in community colleges. The author found that course completion rates were higher when taught by adjunct faculty; however, the courses in question were introductory, so overall retention might be more dependent on other factors including the quality of teaching.

Student Characteristics and Retention and Graduation

Berger and Milem (2000) found that while institutional characteristics were important to student outcomes, individual student characteristics were also important. Deutsch (2015) found SAT reading, SAT math scores, and disadvantaged ethnic/racial status to be predictive of retention rates and graduation rates.

Student preparedness. Much of the published literature on this topic has been based on studies in which the authors used SAT scores (Deutsch, 2015; Ehrenberg & Zhang, 2005). Deutsch (2015) found that SAT reading and math scores were predictive of both retention and graduation rates in public colleges. Although both SAT scores were significantly predictive of graduation in private institutions, neither were predictive of retention. Deutsch's results validate Ehrenberg and Zhang's (2005) previous findings that high SAT math scores and high verbal SAT scores are related to higher graduation rates.

As a measure of student preparedness, I used the percentage of students requiring developmental education in reading and mathematics as determined by the TSI Assessment. Insufficient academic preparation is more prevalent in 2-year than 4-year institutions, particularly in Texas. Nationally, 19.9% of students entering 4-year institutions require developmental education compared to 2-year institutions where 51% of students enter similarly unprepared (Complete College America, 2012). In Texas, only 17.7% of students entering 4-year public institutions require developmental education, but 61% of those entering 2-year institutions require developmental education (THECB, 2017). Studies have shown that developmental education may either improve (Bir & Myrick, 2015; Martin et al., 2017; Trucker, 2014) or hinder (Crisp & Delgado, 2014;

Shields & O'Dwyer, 2017) academic progress, but in this study, developmental education was not an intervention. The requirement to enroll in developmental education courses only served as an indicator of students' lack of academic preparedness.

Race/ethnicity. African American and Hispanic students have lower retention and graduation rates at 2-year institutions (Yu et al., 2015) as compared to White students and at 4-year institutions as compared to the institutional average (Deutsch, 2015). Bir and Myrick (2015) asserted that although graduation rates of African American students had increased significantly, the increase was not sufficient to close or even mitigate the gap between the graduation rates of African American students and those of White students.

African American and Hispanic student retention and graduation rates also remain low in 2-year institutions (Samuel & Scott, 2014; Schademan & Thompson, 2016; Yu et al., 2015). In a national study, Yu et al. (2015) found that increased enrollment of racial/ethnic minority students at 2-year institutions was associated with increased graduation rates, despite minority completion rates themselves being lower than White completion rates in community colleges. Samuel and Scott (2014) expressed concerns that economically disadvantaged Hispanic students had difficulty graduating from college, even from 2-year institutions.

Schademan and Thompson (2016) interviewed eight faculty and 17 gender and ethnically diverse, first-generation, low-income community college students to uncover perceptions of both groups related to student preparedness for college and to learn how faculty can best help students from diverse backgrounds. The researchers concluded that

faculty who believed students with deficient preparation could overcome their deficits were more likely to institute practices that would enable the students to do so. The authors found that these instructors demonstrated an overall level of cultural competence as well as specific strategies such as meaningful discourse, fostering faculty-to-student and peer relationships, and helping students see the relevance of material to their own circumstances.

Fauria (2014) examined THECB data to assess racial and gender education trends in community colleges across Texas. The author concluded that Hispanic enrollment rose 13% from 2000 to 2011 while African American enrollment rose 3%. Samuel and Scott (2014) noted that the retention and graduation rates for racial/ethnic minority students in 2-year Texas institutions, in particular Hispanic students, are low despite relatively high enrollment rates.

Samuel and Scott (2014) surveyed 100 students at two Texas community colleges each serving predominately Hispanic populations to learn why Hispanic college completion remains low despite significant increases in Hispanic student enrollment. The authors found that financial hardship is a challenge particularly for Hispanic students, many of whom are not willing to commit to student loans. Hispanic students are more likely to attend 2-year institutions and may benefit from grants, scholarships, and other forms of financial assistance.

The Texas Higher Education Strategic Planning Committee set an overarching goal to ensure that 60% of individuals aged 25-34 would have a certificate, associates degree, bachelor's degree, or master's degree by 2030 (THECB, 2015). This goal would

be supported by three other goals, the second of which is most germane to my study, as it relates to completion. The committee determined that it was necessary to target specific populations in order to meet this goal: African Americans, Hispanics, men, and economically disadvantaged (Pell Grant recipients) students. Recent THECB (2018b) data suggests that both enrollment and graduation rates among African American and Hispanic students continue to rise at both 2- and 4-year public institutions in Texas, with Hispanic students outpacing goals established in the higher education plan 3 years in a row (THECB, 2018b).

Economic disadvantage. Financial concerns have long been associated with student outcomes (Kezar & Maxey, 2014a). Deutsch (2015) found that the variable of disadvantaged minority students was the most significant variable influencing student retention and graduation rates, negatively affecting both outcomes. Millea, Wills, Elder, and Molina (2018) determined that retention and graduation rates were higher than average among financial aid grant recipients but lower among those students who received student loans. Similarly, Gonzalez Canché (2014) found that graduation rates were lower at both 2- and 4-year institutions for students who received student loans.

Samuel and Scott (2014) indicated that many students attend 2-year institutions because the costs of attending 4-year institutions are too high. Moreover, community colleges and other 2-year institutions often enroll a disproportionate number of economically disadvantaged students compared to 4-year institutions (Gonzalez Canché, 2014). This enrollment inequity between 2- and 4-year institutions may present a greater challenge for racial/ethnic minorities and economically disadvantaged students because,

according to Prystowsky (2018), these students had lower retention and completion rates, especially at community colleges.

In Texas, economically disadvantaged students completed more certificates, associate degrees, and bachelor's degrees in 2016 than did students who were not economically disadvantaged (THECB, 2018b). Although the number of completions grew in the next year, the growth was not enough to keep pace with the goal of the higher education plan for this group. However, according to the THECB report, completion rates for economically disadvantaged students might be elevated due to the definition of economically disadvantaged which includes anyone who ever received a Pell Grant.

Summary and Conclusions

In this chapter I summarized literature related to the variables in my study. Authors exploring the relationship between the proportion of part-time faculty and students' retention and graduation rates have found varying results. Some studies at 2-year institutions found no relationship (Rogers, 2015; Salley & Shaw, 2015), some at both 2- and 4-year institutions found a positive relationship (Caruth & Caruth, 2013; Figlio et al., 2015; Hutto, 2017), and multiple others at both 2- and 4-year institutions have found that higher proportions of part-time faculty can be detrimental to student outcomes (Angelopulo, 2013; Chaden, 2013; Curtis et al., 2016; Hoffman, 2014; Stromquist, 2017).

Several student characteristics are also known to affect retention and graduation rates. Academic preparedness, race/ethnicity, and economic disadvantage have all been associated with retention and graduation rates. Academic preparedness is associated with

higher retention and graduation rates. Race/ethnicity continues to be a major concern because although enrollment rates continue to increase for racial/ethnic minority students, retention and graduation rates have not increased proportionally. Economically disadvantaged students have been shown to have lower retention and graduation rates.

What is not known is how the percentage of part-time faculty separately and in combination with student characteristics relates to student retention and graduation rates specifically those at 2- and 4-year public institutions across the racially and economically diverse state of Texas. In the present study, I used data from the THECB to examine these relationships. I compared these variables between 2- and 4-year public institutions. Unlike most previous research, I included African American and Hispanic students separately instead of putting both groups into a disadvantaged minority category. I will discuss my research design, methodology, threats to validity, and ethical procedures in Chapter 3.

Chapter 3: Research Method

The purpose of this quantitative study was to determine if the proportion of adjunct faculty is predictive of student retention and graduation rates in public, 2- and 4-year colleges in Texas that have diverse student enrollments. In this chapter, I review the research design and outline the methodology and data analysis plan. Potential threats to validity and ethical considerations are also discussed.

Research Design and Rationale

In this study, I used a quantitative, nonexperimental, retrospective, prediction design in which I conducted secondary analysis of existing archival data. The independent variables for this study were the institutional characteristic percentage of part-time faculty as well as student characteristics of academic preparedness; race/ethnicity; and economic disadvantage as measured by the percentages of students requiring developmental education in math or reading, enrollment by race/ethnicity, the average dollar amount of Pell Grant per recipient, the average student debt per graduating student, and the percentage of students graduating with debt, respectively. The relationships of these variables with each of the two dependent variables, retention and graduation rates, were explored. The use of archival data eliminated time and resource constraints that might have otherwise hindered this study. This design is appropriate when research questions can be answered by using readily available data that have not been fully explored (Lodico et al., 2010).

Methodology

Population

The target population for this study was 2- and 4-year public higher education institutions in Texas. There are 51 community colleges in Texas, six of which have multiple campuses that report separately to the THECB (2018a). Together with three members of the Texas State University System that are actually 2-year institutions and six campuses from the Texas State Technical College, there are 55 public, 2-year institutions in Texas, some with multiple campuses that report data separately, for a total of 81 reporting campuses. With the 31 public, 4-year institutions in Texas, there was a combined total of 112 reporting campuses. The existence of a common core of coursework across the first 2 years (THECB, 2018f) as well as the racial/ethnic and economic diversity of students attending these colleges (Fauria, 2014; Horn & Flores, 2012) uniquely qualified the state of Texas as an ideal setting to study this problem.

Sampling and Sampling Procedures

In this study, I used the census sampling method including all 2- and 4-year public higher education institutions in Texas. All 2-year (THECB, 2018d) and 4-year (THECB, 2018e) public institutions are required to submit data to the THECB according to a published schedule and specifications. Institutions with multiple campuses must report data from each campus separately if a campus is located in a tax district that is different than the main campus or if the campus has its own administrative officer (i.e., president, provost, or similar). Six community colleges and Texas State Technical College are required to report data from multiple campuses separately, resulting in

sample sizes of 81 two-year campuses and 31 four-year campuses for this study (see THECB, 2018d). Conducting a power analysis using G*Power 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009) with eight predictor variables, an alpha probability of .05, power of .80, and a medium effect size of .15 indicated that the multiple regression analyses would require a sample of at least 109 institutions. Therefore, when the data available from the THECB were analyzed as a whole, the sample was adequate for the study.

Archival Data

Two-year public institutions and 4-year public colleges and universities in Texas are required by law to prepare and submit the data specified in their respective reporting manuals (THECB, 2018d, 2018e). The data files are submitted online in accordance with mandated due dates listed in the manual. The data for this study were obtained from information collected by the THECB for 2017 that had been made publicly available as well as publicly available data from IPEDS from 2017. The year 2017 was the most recent year for which all data, particularly the 1-year retention rate, was available.

I obtained data regarding the type of institutions (i.e., 2-year or 4-year), percentages of racial/ethnic groups, percentage of students requiring developmental education in math or reading, the average student debt, and the percentage of students graduating with debt from the THECB. The percentage of faculty who were part time for all included institutions were retrieved from IPEDS because this variable was measured differently between 2- and 4-year institutions in the THECB data set. The amount of Pell Grant per recipient was also obtained from IPEDS because it was unavailable from the THECB.

Operationalization of Variables and Constructs

The relationship between the use of part-time faculty and retention and graduation rates was the primary focus of this study that included the variables noted in Table 1. I calculated the percentage of part-time faculty from IPEDS data by dividing the number of part-time faculty by the number of total faculty for each institution.

The students' level of academic preparedness was another independent variable in this study. Some researchers (i.e., Deutsch, 2015; Fauria, 2014) have used SAT scores to measure this construct. SAT scores are not required for many 2-year institutions; however, the percentages of students not meeting college-level standards and, therefore, requiring developmental education in reading, writing, and math are available for both 2- and 4-year public institutions (THECB, 2017). The data are provided as frequencies, which I transformed into percentages by dividing the number of students in each category by the total number of students enrolled. Students requiring developmental writing were not included as a predictor in the current study because of the subjective nature of the grading of that portion of the TSI. In addition, writing was not included as a variable in the study by Deutsch (2015) that was compared with the findings for Texas 4-year schools in this study.

In the data from THECB, enrollment by race/ethnicity is measured by the five broad categories of African American, Hispanic, international student, other, and White. I combined the small percentages of Asian (3%) and international students (2.5%) with the Other category in this study. The race/ethnicity data are presented by THECB as whole numbers and were divided by the total enrollment for each institution to transform them

into percentages. I measured economic disadvantage by the average dollar amount of Pell Grant received per recipient, which Deutsch (2015) found to be a significant predictor of retention. The average Pell Grant amount per student was available in IPEDS. The average debt per student and percentage of students graduating with debt were downloaded from the THECB website.

Table 1

Variables in the Study

	Variable	Variable measurement
Independent Variables:		
Institutional	Type	Dichotomous, 2-year or 4-year
	Adjunct faculty	Percentage of part-time faculty
Student	Race/ethnicity	Percentage of African American, Hispanic, White, Other
	Academic preparedness-reading	Percentage of students requiring developmental reading courses
	Academic preparedness-math	Percentage of students requiring developmental math courses
	Economic disadvantage	Average dollar amount of Pell Grant per recipient Average debt per graduating student Percentage of students graduating with debt
RQ1 dependent	Retention rate	Percentage of students remaining enrolled after 1 year
RQ2 dependent	Graduation rate	Percentage of students within 3 years for 2-year institutions and 6 years for 4-year institutions

Data Analysis Plan

I assumed the data obtained from the THECB were accurate and reliable. Data obtained from IPEDS reports were merged with the THECB spreadsheet to create one

data set. Although no cleaning of the original data was required, standard data cleaning procedures were followed as a precaution due to merging data files and some hand data entry.

I performed multiple regression analysis on the data using Statistical Product and Service Solutions (SPSS) software. Multiple regression, as opposed to ANOVA, was an appropriate analysis to conduct in this study because it “has the capacity to represent, with high fidelity, the types and the complexity of relationships that characterize the behavioral sciences” (Cohen, Cohen, West, & Aiken, 2003, p. 6). Additionally, multiple regression provides effect sizes that “are unit free and are easily understood and communicated” (Cohen et al., 2003, p. 5).

The multiple regression analysis requires that the dependent variable be measured on a continuous scale (Cohen et al., 2003). The retention and graduation rates were reported as percentages, and therefore, both are on continuous scales. A further assumption that must be met for multiple regression analysis is that the residuals of the variables must be normally distributed because a linear relationship must exist between the dependent variable and each independent variable (Cohen et al., 2003). In a simple regression analysis, it is assumed that plotting paired independent and dependent variables will result in a straight line (Cohen et al., 2003). In multiple regression analysis, it is assumed that any additional independent variables are also assumed to have linear relationships with the dependent variable.

The next three assumptions are related to the residuals of each independent variable. *Homoscedasticity* is the condition in which every residual for each independent

variable has equal variance from a regression line (Cohen et al., 2003). Independence of residuals refers to the absence of clustering of residuals, as might be seen in a biased sample in which the residuals are not independent (Cohen et al., 2003). Ernst and Albers (2017) found that many researchers believe the independent variables, if not the dependent variables, must be normally distributed; however, normality of residuals is the assumption that for each independent variable the residuals are normally distributed (Cohen et al., 2003). It must be assumed that there is an absence of multicollinearity, which is the condition of two or more independent variables being highly correlated with each other (Cohen et al., 2003). The last assumption was that the data are free from outliers that exert excess leverage on the analysis. I used the SPSS software to determine if the statistical assumptions were met. Before evaluating the hypothesis, it was also imperative to determine how well a regression equation predicts the dependent variable. The multiple correlation coefficient, represented by R , indicates how well the regression equation predicts the dependent variable (Cohen et al., 2003).

Threats to Validity

External validity refers to the ability of a researcher to generalize the findings of a study to a larger population (Lodico et al., 2010). This study included 2- and 4-year public institutions in Texas. The results may not be generalizable to private institutions or institutions outside of Texas. Common threats to external validity, such as population validity, treatment effects, Hawthorne effects, novelty and disruption effects, and experimenter effect, are not likely in a secondary analysis of archival data (Gall, Gall, & Borg, 2007).

Internal validity is the likelihood that results are due to the variable being studied and not an unintentional confounding variable (Lodico et al., 2010). Although the focus of this study was whether the proportion of part-time faculty is predictive of retention and graduation rates, I used multiple regression analyses to consider a variety of variables to determine the effect of these institutional and student characteristics. A census sample and data that are mandatorily reported were used in this study, which eliminated self-selection or other sampling bias. Despite the correlational nature of the study, there was a meaningful possibility of retention and completion initiatives already in place introducing error into this study.

Construct validity implies that the measured variable is reflective of the construct under study (Lodico et al., 2010). In this study, I used variables that had been directly measured by the institutions and reported to THECB and IPEDS. In previous studies, Ehrenberg and Zhang (2005) and later Deutsch (2015) used the percentage of part-time faculty as a predictor of student retention and graduation rates. One-year retention rates have also been widely used as a valid outcome measure (Raymondo, 2003). According to the National Center for Education Statistics (2018), institutions of higher learning are required by law to report their graduation rates at 150% of the expected time for completion. Due to its availability, this measure has been used extensively in research as a student outcome measure.

Possible threats to statistical validity include the use of a small sample size or an inappropriate test and failing to check assumptions. A power analysis showed that the sample size would be sufficient for this study. I followed Ernst and Albers's (2017)

recommendation for rigorous checking of assumptions to ensure the validity of conclusions.

Ethical Procedures

In this study, I used archival aggregated data from 2- and 4-year educational institutions that did not permit the identification of any individual faculty member or student. The data set that was used for this study is publicly available and does not require safeguarding. I did not analyze any data until I received approval from the Walden University Institutional Review Board with approval number 08-26-19-0531695. The data will be retained for a period of 5 years after completion of the study.

Summary

In this chapter, I described my population and sample, specified my data sources, further defined my variables, explained my rationale for using multiple regression analyses to answer the research questions, and addressed potential threats to validity and ethical procedures. Using census sampling, this study included the 112 separately reporting campuses for all public, 2- and 4-year institutions in Texas (see THECB, 2018a). The primary data sources were the publicly available data on the THECB and IPEDS websites. Because the employment status of faculty at 2- and 4-year institutions are measured differently, I determined the percentage of part-time faculty from data available through IPEDS. The independent variables were consistent with Deutsch's (2015) with two notable exceptions. First, because of the large degree of racial/ethnic diversity within and among institutions in Texas, I further delineated Deutsch's disadvantaged minority category by including the enrollment percentages of African

American, Hispanic, White, and Other students. Second, as a measure of academic preparedness, I included the percentage of students requiring developmental reading and math courses enabling me to compare 4-year institutions with 2-year institutions, which do not generally require SAT scores. The multiple regression analyses allowed me to examine the relationship of part-time faculty with the student success measures of retention and graduation while considering differences related to institutional and student characteristics. In the next chapter, I will discuss the results of the study.

Chapter 4: Results

The purpose of this quantitative study was to determine if the proportion of adjunct faculty is predictive of student retention and graduation rates in public, 2- and 4-year colleges in Texas that have diverse student enrollments. This chapter includes a discussion of the data collection procedures, data retrieval and recoding procedures, and the results of the study. The research questions and hypotheses were as follows:

RQ1: Which of the following variables are predictors of student retention for 2- and 4-year institutions in Texas?

- percentage of part-time faculty
- enrollment percentages by race/ethnicity
- percentage of students in developmental courses
- amount of Pell Grant received per recipient
- the average student debt per graduating student
- the percentage of students graduating with debt

H_0 1: None of the following variables are significant predictors of student retention rates for 2- and 4-year institutions in Texas.

- percentage of part-time faculty
- enrollment percentages by race/ethnicity
- percentage of students in developmental courses
- amount of Pell Grant received per recipient
- the average student debt per graduating student
- the percentage of students graduating with debt

H_{A1} : At least one of the following variables is a significant predictor of student retention rates for 2- and 4-year institutions in Texas.

- percentage of part-time faculty
- enrollment percentages by race/ethnicity
- percentage of students in developmental courses
- amount of Pell Grant received per recipient
- the average student debt per graduating student
- the percentage of students graduating with debt

RQ2: Which of the following variables are predictors of student graduation rates for 2- and 4-year institutions in Texas?

- percentage of part-time faculty
- enrollment percentages by race/ethnicity
- percentage of students in developmental courses
- amount of Pell Grant received per recipient
- the average student debt per graduating student
- the percentage of students graduating with debt

H_{02} : None of the following variables are significant predictors of student graduation rates for 2- and 4-year institutions in Texas.

- percentage of part-time faculty
- enrollment percentages by race/ethnicity
- percentage of students in developmental courses
- amount of Pell Grant received per recipient

- the average student debt per graduating student
- the percentage of students graduating with debt

H_{A2}: At least one of the following variables is a significant predictor of student graduation rates for 2- and 4-year institutions in Texas.

- percentage of part-time faculty
- enrollment percentages by race/ethnicity
- percentage of students in developmental courses
- amount of Pell Grant received per recipient
- the average student debt per graduating student
- the percentage of students graduating with debt

Data Retrieval and Recoding

I elected to acquire as many variables as possible from the THECB in order to maintain a distinction between the campuses that reported collectively to IPEDS. I downloaded the data related to the number of students by racial/ethnic group from the THECB and calculated the percentages based on the totals for all groups. As planned, I combined the students categorized as Asian and as international with those categorized as Other. The percentage of students requiring developmental education in math and in reading for each campus was publicly available from the THECB but not in the form of a spreadsheet. To decrease the potential for making errors while manually entering the data, I requested and acquired permission from the Walden University Institutional Review Board to accept the data in a spreadsheet directly from the THECB. The THECB accommodated my request. I was able to download the data regarding average student

debt, percentage of students graduating with debt, and the graduation rates from the THECB publicly available website. One-year retention rates were unavailable, but I was able to calculate the retention rates by dividing the number of retained full-time students from each institution by the first time in college full-time admissions from the previous year.

I downloaded the data regarding percentages of part- and full-time faculty from the IPEDS website because THECB does not make these data available for 4-year institutions. For the 2-year institutions that reported separately to the THECB yet collectively to IPEDS, I downloaded part-time and full-time faculty data from the THECB website to fill in the missing data. I downloaded the average dollar amount of Pell Grant from IPEDS as well to be consistent with previous researchers (see Deutsch, 2015; Ehrenberg & Zhang, 2005). Data for the 19 campuses that report separately to THECB, but collectively to IPEDS, were not available, so I used the institutional average for each of the multiple campuses.

Results

Descriptive Statistics

I computed descriptive statistics for the sample that included 112 campuses (see Table 2). Nearly half of the faculty (49%) were part time. The mean percentages of Hispanic and White students were nearly equal at 38%, with nearly 14% African American and 10% Other students. Almost half (47%) of the students required developmental math, but only about 30% required developmental reading. With 43% of students graduating with debt averaging over \$19,000 and average Pell Grants of \$4,500,

there was a high mean percentage of economically disadvantaged students represented in the sample.

Table 2

Descriptive Statistics for the Sample

Variable	<u>Total Sample</u> (<i>N</i> = 112)		<u>2-Year Institutions</u> (<i>n</i> = 81)		<u>4-Year Institutions</u> (<i>n</i> = 31)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Percent part-time faculty	49.2	19.0	56.2	16.4	30.8	11.7
Student race						
Percent African American	13.9	12.1	12.8	8.3	16.5	18.7
Percent Hispanic	38.1	21.4	39.3	20.9	34.9	22.5
Percent Other	9.9	7.0	9.1	6.9	11.9	7.0
Academic preparedness						
Percent requiring dev math	47.0	19.4	55.2	12.4	25.7	18.0
Percent requiring dev reading	29.9	16.4	35.4	13.2	15.5	15.2
Economic disadvantage						
Average Pell Grant award	\$4,503	\$428	\$4,456	\$481	\$4,625	\$199
Average student debt	\$19,227	\$7,810	\$15,095	\$2,865	\$30,024	\$6,099
Percent graduating with debt	43.0	17.5	34.7	12.4	64.5	7.3

Assumptions of the Statistical Tests

Assumption of normally distributed residuals. I tested the assumption of normal distribution of variables using the Shapiro-Wilk statistic. The residuals for each variable were significant, indicating none of the variables had residuals that were normally distributed. Therefore, the assumption of normally distributed variables was not met. Fortunately, multiple regression is robust to the violation of this assumption with sample sizes larger than 40 (see Ghasemi & Zahediasl, 2012). Ernst and Albers (2017) suggested that visual methods are preferred for testing this assumption because formal tests are only powerful when the total sample is large, in which case the “violations of

normality have only limited effects on the accuracy of the estimates” (p. 6). I visually inspected the plots and determined the residuals of the dependent variables were roughly normally distributed. Figures 1 and 2 represent these analyses where Panel A: Percentage of part-time faculty, Panel B: Percentage of African American students, Panel C: Percentage of Hispanic Students, Panel D: Percentage of Other students, Panel E: Percentage of White students, Panel F: Percentage of students requiring developmental education in math, Panel G: Percentage of students requiring developmental education in reading, Panel H: Average Pell Grant per recipient, Panel I: Average student debt, and Panel J: Percentage of students graduating with debt.

Assumption of linearity. I tested the assumption that each independent variable has a linear relationship with the dependent variables by examining scatterplots between each independent variable and each of the two dependent variables. Each dependent variable had a roughly linear relationship with each of the two independent variables.

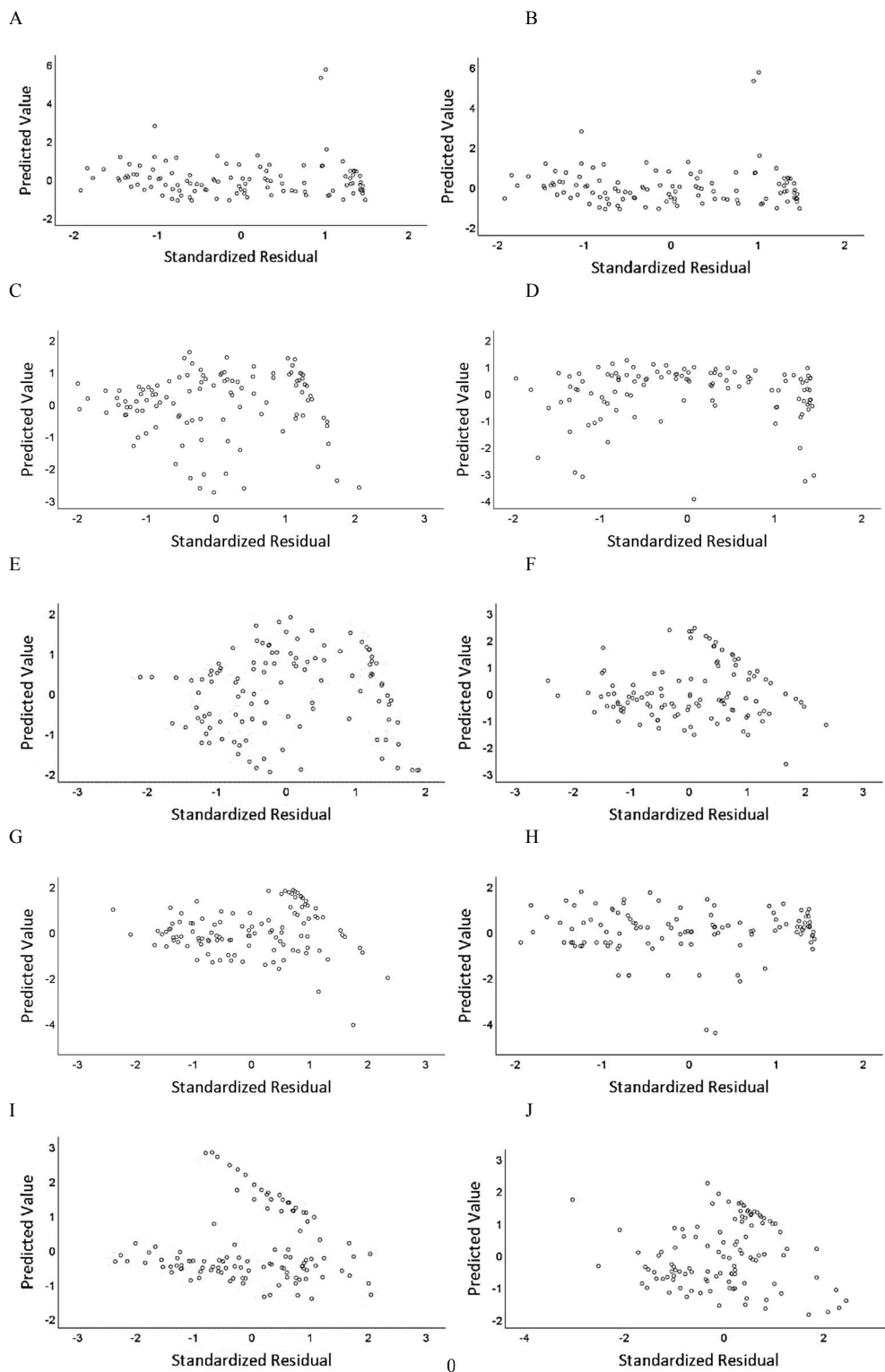


Figure 1. Plots of independent variables with retention.

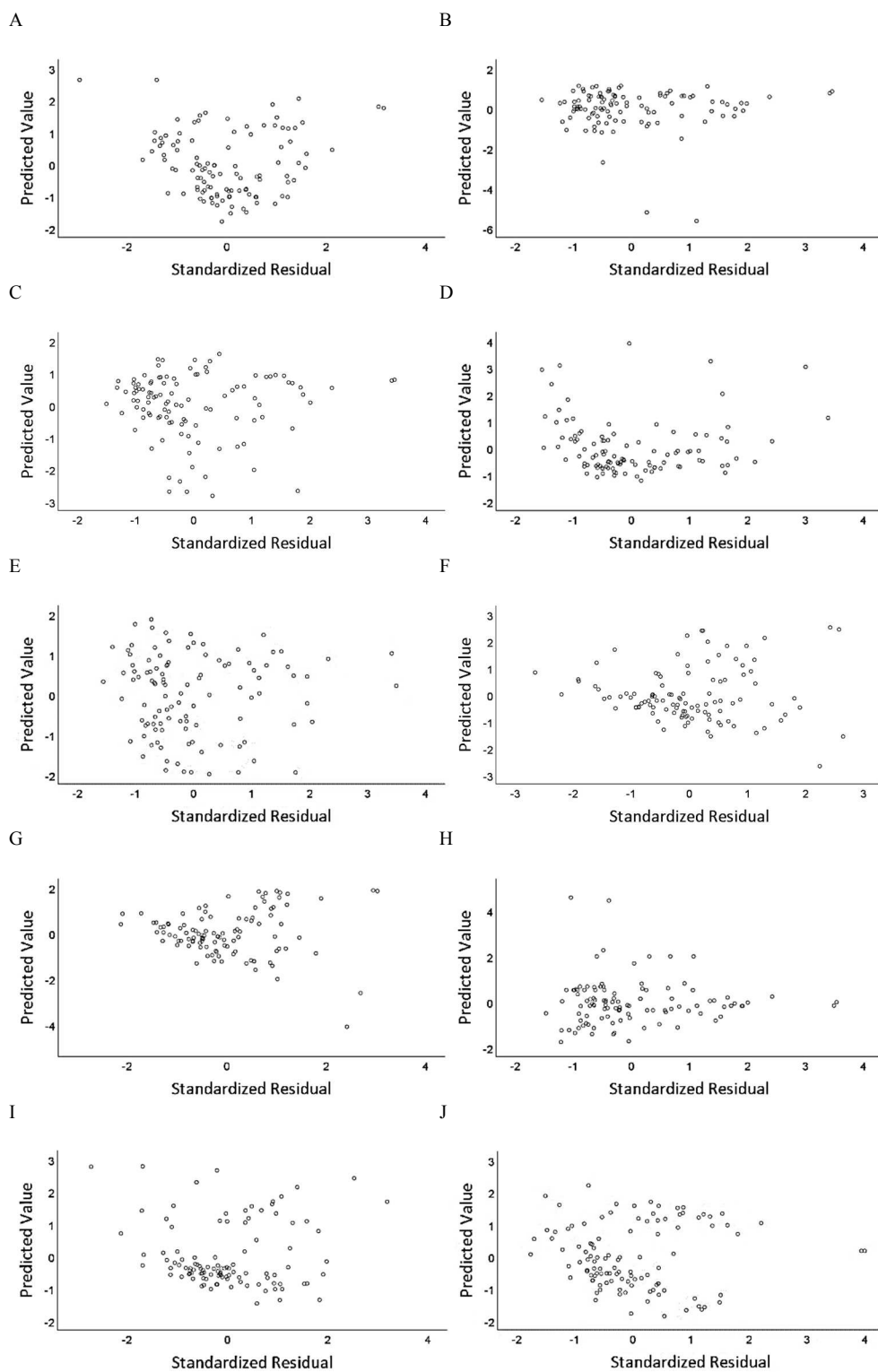


Figure 2. Plots of independent variables with graduation

Assumption of the absence of multicollinearity. I examined Pearson's correlations between the independent variables to determine if any of them were highly correlated as well as the collinearity tolerance and variance inflation factor (VIF) of each variable to determine if the correlation between any two independent variables was great enough to violate the assumption of the absence of multicollinearity. The high correlation ($r = .733, p < .001$) between average student debt (tolerance = .179, VIF = 5.601) and the percentage of students graduating with debt (tolerance = .297, VIF = 3.369) was anticipated but did not violate the assumption. Neither the high correlation ($r = .859, p < .001$) between type of institution (tolerance = .130, VIF = 7.673) and average student debt nor the high correlation ($r = .767, p < .001$) between type of institution and percentage of graduates with debt violated the assumption. The correlation ($r = .932, p < .001$) between the percentages of students who required developmental education in math (tolerance = .066, VIF = 15.152) and students who required developmental education in reading (tolerance = .091, VIF = 10.959) did violate the assumption but, ultimately, did not affect the analysis because the stepwise procedure did not include the percentages of students who required developmental education in math in the analysis of retention rates or the percentages of students who required developmental education in reading in the analysis of graduation rates.

I found a negative correlation ($r = .745, p < .001$) between the percentage of White students and Hispanic students. As the two largest racial/ethnic groups, it is not surprising that an increase in one would almost necessitate a decrease in the other at most Texas institutions. I chose to exclude the percentage of White students in order to retain

the percentage of Hispanic students because the latter was one of the previously identified disadvantaged groups, which were both of interest in this study.

Assumptions of homoscedasticity and independence of residuals. Scatterplots with regression standardized predicted values (ZRESID) on the x axis and regression standardized residuals (ZPRED) on the y axis indicated that the assumption of homoscedasticity was not violated for the analysis with either criterion variable as shown in Figure 3. I tested the assumption that the residuals are independent using the Durbin-Watson statistic; the values for retention and graduation were 1.673 and 1.601, respectively, indicating that the assumptions were met.

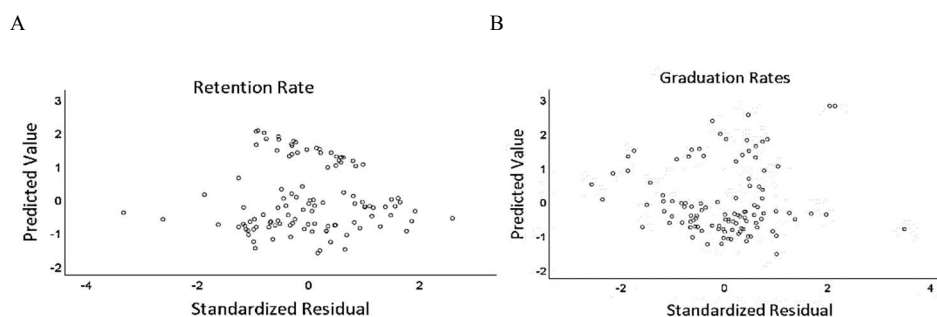


Figure 3. Plots of independent variables with retention and graduation. In this figure Panel A: Combined independent variables with retention rates as the dependent variable and Panel B: Combined independent variables with graduation rates as the dependent variable.

Assumptions of no significant outliers. The case wise diagnostics tables for retention and graduation revealed one outlier for retention, with a standardized residual of -3.328 and one outlier with a standardized residual of 3.496 for graduation. I chose to retain each of these in the analyses because they represent the actual differences in institutions.

Retention Rates

I conducted a stepwise analysis to determine the best model for predicting retention using the default settings in SPSS for including ($p = .05$) and excluding ($p = .1$) variables. The most inclusive model ($R^2 = .779$, $R^2_{adj} = .766$, $F(6, 105) = 61.531$, $p < .001$) is shown in Table 3 with the variables listed in the order in which they were entered into the model. The model did not include the percentage of students requiring developmental education in math, resolving the violation of the assumption of the absence of multicollinearity. The results supported rejecting the null hypothesis pertaining to the first research question because six of the factors, including the variable of interest, were significantly predictive of retention.

Table 3

Stepwise Multiple Regression of Factors Affecting Retention

Variable	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
Type of institution	-.15	.014	-.76	-10.79	<.001
Percent part time	-.32	.080	-.23	-3.92	<.001
Race					
Percent Hispanic	-.36	.067	-.30	-5.39	<.001
Percent Other	-.84	.182	-.23	-4.61	<.001
Percent African American	-.32	.121	-.15	-2.69	.008
Academic preparedness					
Percent requiring dev reading	.19	.093	.12	2.02	.046

Graduation Rates

The stepwise analysis for graduation rates eliminated the percentage of students requiring developmental education for reading resolving the violation of the assumption of the absence of multicollinearity. Table 4 summarizes the results of the predictive model ($R^2 = .720$, $R^2_{adj} = .709$, $F(4, 103) = 66.294$, $p < .001$). The results supported

rejecting the null hypothesis pertaining to the second research question because four of the factors, including the variable of interest, were significantly predictive of retention.

Table 4

Stepwise Multiple Regression of Factors Affecting Graduation

Variable	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
Type of institution	-.05	.012	-.44	-4.22	<.001
Academic preparedness					
Percent requiring dev math	-.31	.062	-.38	-5.01	<.001
Percent part time	-.31	.058	-.37	-5.31	<.001
Economic disadvantage					
Percent Graduating with Debt	-.21	.077	-.24	-2.78	.007

Additional Testing

I wanted to explore the difference between the 2- and the 4-year institutions. I conducted additional stepwise analyses of retention in 2-year institutions ($R^2 = .464$, $R^2_{adj} = .428$, $F(5, 75) = 12.988$, $p < .001$). None of the variables met the inclusion criterion ($p < .05$) in the stepwise analysis of retention for the 4-year institutions; therefore, no analysis was conducted. I was able to conduct the stepwise analyses for graduation in both 2-year ($R^2 = .256$, $R^2_{adj} = .236$, $F(2, 75) = 12.895$, $p < .001$) and 4-year ($R^2 = .696$, $R^2_{adj} = .673$, $F(2, 27) = 30.903$, $p < .001$) institutions. Table 5 summarizes the most inclusive models for these analyses.

Table 5

Stepwise Analyses of Factors Affecting Retention and Graduation in 2- and 4-Year Institutions

Variable	B	SE	β	t	p	R ²	SE	p
2-Year Retention						.428	.137	<.001
Percent part time	-.30	.099	-.27	-3.06	.003			
Race								
Percent Hispanic	-.49	.087	-.57	-5.65	<.001			
Percent Other	-1.09	.245	-.41	-4.44	<.001			
Percent African American	-.52	.218	-.24	-2.40	.019			
Academic preparedness								
Percent requiring dev reading	.27	.121	.20	2.24	.028			
2-Year Graduation						.236	.069	<.001
Economic disadvantage								
Average student debt	.00	.000	-.35	-3.46	.001			
Percent part time	-.17	.049	-.34	-3.39	.001			
4-Year Graduation						.673	.087	<.001
Academic preparedness								
Percent requiring dev math	-.58	.094	-.69	-6.20	<.001			
Percent part time	-.43	.148	-.32	-2.92	.007			

The most inclusive model for retention in 2-year institutions indicated that all five variables (type of institution was not a variable after the sample was split) that were significant predictors of retention in the full sample were significant predictors of retention in the 2-year institutions. Analysis of retention rates in 4-year institutions was not performed because none of the variables met the inclusion criterion ($p < .05$). Only average student debt and the percentage of part-time faculty were included in the predictive model for graduation in 2-year institutions and the percentage of students that required developmental education in math and the percentage of part-time faculty were included in the predictive model for graduation in 4-year institutions.

Summary

The results supported rejecting both null hypotheses because my variable of interest, the percentage of part-time faculty, was significantly predictive of both retention and graduation. After dividing the sample into 2- and 4-year institutions, the percentage of part-time faculty was predictive of retention in 2-year institutions and graduation in both 2- and 4-year institutions. In 2-year institutions, race/ethnicity and percentage of students requiring developmental reading classes were predictive of retention; average student debt was predicative of graduation. In 4-year institutions, percentage of students requiring developmental math classes was predictive of graduation. These results are discussed further in Chapter 5.

Chapter 5: Discussions, Conclusions, and Recommendations

The purpose of this study was to determine if the proportion of adjunct faculty is predictive of student retention and graduation rates in public, 2- and 4-year colleges in Texas that have diverse student enrollments. I used a quantitative, nonexperimental, retrospective, prediction design employing secondary analysis of existing, publicly available, archival data for each of the public, 2- and 4-year institutions in Texas. This study was guided by Berger and Milem's (2000) theoretical framework.

The results supported rejecting both null hypotheses because the percentage of part-time faculty, the variable of interest, was a significant inverse predictor of both retention and graduation. Additionally, five other variables were predictive of retention and three additional variables were predictive of graduation. Type of institution and the percentages of African American students, Hispanic students, and Other students were all inversely related to retention. The percentage of students requiring developmental education in reading was the only positive predictor of retention found in the study. Type of institution, the percentage of students requiring developmental education in math, and average student debt were all inversely related to graduation.

Interpretation of the Findings

Type of institution was the most significant predictive variable for both dependent variables of retention and graduation. As expected, retention and graduation rates were lower for 2-year institutions than for 4-year institutions. Percentage of part-time faculty was the most significantly predictive variable of retention at 2-year institutions followed by percentage of Hispanic students, Other students, and African American students, all of

which had inverse relationships with retention. Therefore, higher percentages for each of these predictors was related to significantly lower retention rates. Graduation for 2-year institutions was significantly predicted by average student debt and the percentage of part-time faculty, both inverse relationships. For 4-year institutions, none of the predictors of retention met the criterion for inclusion in the analysis ($p < .05$). The percentage of students that required developmental education in math and the percentage of part-time faculty were inversely related to graduation in 4-year institutions.

In the total sample, the percentage of part-time faculty was the second most predictive variable of retention rates (following type of institution) and the third most predictive variable of graduation rates (following type of institution and the percentage of students requiring developmental education in math), with inverse relationships with both dependent measures. While most studies have found either no relationship (Rogers, 2015; Salley & Shaw, 2015) or a negative relationship (Angelopulo, 2013; Chaden, 2013; Curtis et al., 2016; Ehrenberg & Zhang, 2005; Hoffman, 2014; Stromquist, 2017) between the percentage of part-time faculty and student outcomes, some have found a positive relationship (Figlio et al., 2015; Hutto, 2017). Authors who have found a negative relationship have expressed varied concerns about part-time faculty, including their higher proportion of teaching work load as compared to administrative time, less engagement with institutional concerns, less interaction with students outside the classroom, and the effect these and other concerns have on student outcomes.

Hutto (2017) found a positive relationship between part-time faculty and course completion for introductory courses at 2-year institutions, while Figlio et al. (2015) found

a positive relationship between part-time faculty and student learning, retention, and subsequent student performance at a 4-year institution. Both studies demonstrated that part-time faculty can be used effectively. Neither study, however, evaluated the relationship between part-time faculty and graduation rates.

With smaller budgets, the institutional behavior of hiring part-time faculty largely as a cost saving measure might be more prevalent in 2-year than 4-year institutions. In the subsamples, the percentage of part-time faculty was almost twice as high in 2-year institutions than in 4-year institutions.

The percentage of part-time faculty was inversely related to graduation rates in both 2- and 4-year institutions, meaning that more part-time faculty related to lower graduation rates. However, the β weights (unadjusted) were more than twice as low (negative) in the 4-year institutions. Every percentage point increase in part-time faculty was reflected by more than twice as large a decrease in graduation rates at 4-year institutions than at 2-year institutions. Therefore, if higher percentages of part-time faculty result in lower graduation rates, this effect is greater at 4-year than at 2-year institutions. One possible explanation for this might be that the 2-year institutions, many of which offer vocational certificates, employed a large percentage of adjunct faculty to teach small class sizes or supervise students in laboratory or field experiences that would have a smaller effect on graduation.

The β (adjusted) weights between the two types of institutions were nearly equal, suggesting that the predictive value of the variable was similar for both types, despite the percentage of part-time faculty being almost twice as large at 2-year institutions than at 4-

year institutions. This is not to say that 2-year institutions should not be concerned about employing a large percentage of part-time faculty, but as an institutional behavior, the acceptable percentage of part-time faculty might be higher at 2-year institutions. Perhaps this helps explain why the reviewed studies that were conducted at 2-year institutions found either a positive relationship (Hutto, 2017) or no relationship (Rogers, 2015; Salley & Shaw, 2015) between the percentage of part-time faculty and student outcomes, whereas the studies conducted at 4-year institutions tended to find a negative relationship (Angelopulo, 2013; Hoffman, 2014). Several studies in both 2- and 4-year institutions had a similar focus, with some finding a positive relationship between higher percentages of adjunct faculty and student outcomes (Caruth & Caruth, 2013; Figlio et al., 2015; Hutto, 2017) and multiple others finding a negative relationship between higher percentages of adjunct faculty and student outcomes (Angelopulo, 2013; Chaden, 2013; Curtis et al., 2016; Ehrenberg & Zhang, 2005; Hoffman, 2014; Stromquist, 2017).

The three racial/ethnic categories of students included in this study were fairly evenly distributed between the 2- and 4-year institutions but not necessarily among the institutions themselves. One notable example was the standard deviation of the percentage of African American students, which was more than twice as high in 4-year institutions than 2-year institutions. This example reflects large differences in the percentage of African American students among 4-year institutions; the percentages are not as varied among 2-year institutions. Whereas the standard deviation of the percentage of Hispanic students shows little difference between 2- and 4-year institutions, the

standard deviation is high across all institutions, indicating large variability in the percentages of Hispanic students across all institutions.

The percentages of the three racial/ethnic groups were inversely related to retention rates in the overall model and the analysis of 2-year institutions. The order of entry of the percentages of racial/ethnic groups into both of these models was Hispanic students, Other students, and African American students. This indicates that the percentage of Hispanic students was a stronger predictor of retention, followed by Other students and, finally, African American students. None of the racial/ethnic group percentages significantly predicted graduation in either the overall analysis or the analyses of 2- and 4-year institutions.

Similar to Deutsch's (2015) findings concerning SAT scores, the percentage of students requiring developmental education in reading was predictive of retention and the percentage of students requiring developmental education in math was predictive of graduation. The percentage of students requiring developmental education for reading was, like math, more than twice as high at 2-year institutions than at 4-year institutions. This variable was a positive predictor of retention in the total sample and in the 2-year institutions. This was the only variable that had a positive β (adjusted), indicating a direct relationship in each analysis. This finding would seem to indicate that the higher the percentage of students at an institution requiring developmental education in reading, the higher the retention rate.

I selected the percentage of students requiring developmental education as a measure of academic preparedness that was used for both 2- and 4-year institutions.

Perhaps the effects of the measure were mitigated, even confounded, by the treatment effect of these students (presumably) receiving additional support early in their postsecondary education. This positive relationship did not seem to carry through to graduation, supporting the notion that it was the increased support that caused many students who required developmental education in reading to be retained into their second year but not necessarily sustained until graduation. That is, once the developmental education was completed, many of the students failed to complete their degree plans. This interpretation is consistent with Complete College America (2012) that found fewer than 1 out of 10 community college students who took developmental classes graduated within 3 years; similarly, only about one third of students at 4-year schools who took developmental classes finished a bachelor's degree in 6 years. It might also be that the students who did not need developmental education were concentrated in institutions that offered more student support in general, therefore increasing retention, even among students who did not require developmental education (Martin et al., 2017).

The percentage of students requiring developmental education for math was the second most inversely related variable for graduation in the total sample and the most inversely related variable at 4-year institutions. Although the percentage was more than twice as high at 2-year institutions, which accounted for the majority of the sample, the percentage of students requiring developmental education for math was not predictive of graduation at 2-year institutions. This may indicate that additional math courses are required for graduation from 4-year institutions.

As expected, the percentage of students graduating with debt was about twice as high for students graduating from 4-year institutions as for students graduating from 2-year institutions. The percentage of students graduating with debt was the least important of the predictors of graduation rates in the total sample and was not a predictive variable in either of the subsamples. Previous studies similarly found that economic disadvantage was greater at 2-year institutions (Gonzalez Canché, 2014; Samuel & Scott, 2014), resulting in lower graduation rates (Prystowsky, 2018).

The average student debt was also about twice as high in 4-year institutions but predictive only of graduation in 2-year institutions. The average Pell Grant awarded was not predictive of either retention rates or graduation rates, which conflicted with the findings of Millea et al. (2018) that both retention and graduation rates were higher than average among grant recipients.

Limitations of Study

The greatest limitation to this study was the marginal sample size. Although the total sample was large enough to produce significant results, after the sample was divided, most of these same variables were only predictive of retention in 2-year institutions. The analyses of the graduation rates yielded only two significantly predictive variables for 2-year institutions and two (one in common) for 4-year institutions, and no significant predictors of retention at 4-year institutions.

A second limitation was the inability to distinguish how the part-time faculty were being utilized by different institutions. Institutions employing a large percentage of part-time faculty to maintain safe supervision ratios, such as during laboratory or field

experiences, might be using them more effectively than those using part-time faculty as a less expensive substitute for full-time faculty. Some institutions may be allowing junior part-time faculty to teach introductory courses, while others may have working professionals with current expertise in their respective disciplines teaching advanced courses.

A third limitation to this study was generalizability. Restricting the study to public institutions in Texas allowed me to analyze a census sample of institutions with standardized reporting criteria yet diverse in student characteristics (i.e., demographics and academic preparedness). That said, the results of the study might not be generalizable to private institutions or institutions outside of Texas.

Recommendations

Situated between national studies and institutionally supported studies, the unusual scope of this study resulted in a sample size that was marginally large enough for the analyses on one hand and limited to percentages and mean data on the other. Concerning sample size, a regional study incorporating neighboring states with diversity similar to that found in Texas institutions would allow for a larger sample that could be divided into the two types of institutions. Without Texas's common core system, however, the comparison of retention between 2- and 4-year institutions might not be as reliable. The larger sample, as well as the inclusion of private institutions, might result in greater generalizability but at the expense of excluding academic preparedness as a control variable. Determining how part-time faculty are being used would likely require

access to nonpublic data, such as might be characteristic of a study performed at a single institution or several cooperating institutions.

Implications

The results of this study seem to indicate that public institutions might see increased retention and graduation rates by employing more full-time faculty. Employing higher proportions of full-time faculty at higher education institutions might lead to positive social change in Texas because more students may be retained and graduate from these institutions. Some studies reported in the literature, however, suggest that part-time faculty can be employed effectively for introductory courses (Hutto, 2017) or when provided the support (Caruth & Caruth, 2013) and administrative time (Kezar et al., 2016) needed to be more effective.

The methodological implication of this study was that it validated the percentage of part-time faculty as being similarly predictive of graduation rates in 2- and 4-year institutions, despite the percentages of part-time faculty being almost twice as high at 2-year institutions than at 4-year institutions. Theoretically, this study validates that institutional behavior, at least concerning the percentage of faculty that are part time, should be based on institutional characteristics, such as the number and types of programs offered, and not a generalizable threshold.

Conclusions

The results of this study indicate that smaller percentages of part-time faculty might result in higher retention rates at 2-year institutions and higher graduation rates at both 2- and 4-year institutions in Texas. Although a few previous studies included both 2-

and 4-year institutions, in this study I compared these two types of institutions having similar state-mandated core course requirements and using developmental education measures required by the state though not available on a national level. Because I delineated four racial/ethnic categories of students in this study, the results provided better insight into how the percentages of different racial/ethnic student groups affect retention compared to other studies that either focused on one racial/ethnic student group or combined several racial/ethnic student groups into one variable. While more studies are needed to determine how part-time faculty can best be employed at different institutions, the findings of this study provide a clearer picture of how part-time faculty ratios may be better used to facilitate the academic success of the diverse populations of students in Texas.

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